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SUBJECT Thema	Wireless M-Bus Module PAN7550	PAGE Seite	1 of 27
CUSTOMER PART NUMBER PAN7550	PANASONIC PART NUMBER ENW59620(2)xyCF	DATE Datum	13.03.2010

Specification for Production

Applicant / Manufacturer
Hardware

Panasonic Electronic Devices Europe GmbH
Zeppelinstrasse 19
21337 Lüneburg
Germany

Applicant / Manufacturer
Software

Wireless M-Bus Stack from ScatterWeb GmbH or
your own written software

Software Version
Contents

Approval for Mass Production

Customer

By signing this document, Customer accepts the validity of the below-mentioned contents and declares his full notice to it. Some passages may be changed if required; the validity shall not be affected thereby.

CHECKED / APPROVED:

DATE:	NAME:	SIGNATURE:

NOTE:

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PRELIMINARY

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<div>1. KEY FEATURES Schlüsseleigenschaften</div> <div><div><div>• General Features</div><div><div><div>○ Small Size (13.7 mm x 32.0 mm x 2.85 mm)</div><div>○ Temperature Range from -40°C to +85°C</div><div>○ Supply Voltage Range from 1.8 V to 3.6 V</div><div>○ Very low Current Consumption for increased Battery Life</div><div>○ Additional 64k internal SPI EEPROM</div><div>○ UART and SPI Bus</div><div>○ 3 Antenna Options: Internal Ceramic Antenna, UFL Plug, Single Port 50 Ohm</div><div>○ 32kByte + 256Byte Flash and 1kByte RAM Memory</div><div>○ IrDA Encoder and Decoder</div><div>○ Configurable Operational Amplifier</div><div>○ Brownout Detector</div><div>○ Bootstrap Loader</div><div>○ 12 channel 10 Bit A/D Converter with internal Reference Sample-and-Hold, Autoscan, and Data Transfer Controller</div><div>○ 2 x 16 Bit Timers with Capture/Compare Registers</div><div>○ In total 27 digital I/O lines with programmable pullup / pulldown resistors</div></div></div><div><div>• RF Features</div><div><div><div>○ Programmable Data Rate from 1.2 to 500 kBaud (NRZ mode)</div><div>○ High Sensitivity -109 typ. at 1% PER and 1.2 kbps</div><div>○ Programmable Output Power from +10 to -30 dBm</div><div>○ Full 128-bit Encryption</div><div>○ Very Low Power Modes</div><div>○ Support for 2-FSK, GFSK, MSK, OOK and ASK</div><div>○ Programmable Carrier Sense (CS) Indicator, Preamble Quality Indicator (PQI), Link Quality Indicator (LQI) and Clear Channel Assessment (CCA)</div></div></div></div></div><div>2. APPLICATIONS FOR THE MODULE Anwendungen für das Modul</div><div><div><div>• AMR- Automatic Meter Reading</div><div>• Medical Applications</div><div>• Wireless Sensors</div><div>• Industrial Applications</div><div>• RKE - Two-way Remote Keyless Entry</div><div>• Remote Control Systems</div><div>• Automotive Applications</div><div>• Home Automation Systems</div></div></div></div>					
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3. DESCRIPTION OF THE MODULE

Beschreibung des Moduls

The PAN7550 module is a short range, low power, 868 MHz ISM band modem which is mainly intended for Wireless M-Bus applications regarding to the EN 13757-4 standard. It includes a very low power microcontroller (MCU) based on the MSP430 family and a low power RF transceiver from Texas Instruments. This combination provides cost effective solutions for short range data links and wireless networks.

The module is offered with an internal ceramic chip antenna, an UFL plug or a 50 ohm single port on the bottom side of the module.

The main software solution for the PAN7550 is the Wireless M-Bus Stack from ScatterWeb GmbH. For details please refer to [1]. In addition you are also free to develop your own software by using any software development solution for the mentioned microcontroller. For device flash programming you are able to use two different interfaces, the JTAG interface or the Spy-Bi-Wire interface.

An application kit is also available for fast prototyping and application evaluation. For details please refer to [3].

4. SCOPE OF THIS DOCUMENT

Umfang dieses Dokumentes

This product specification applies to the Wireless M-Bus Module ENW59620(2)xyCF.

The xy is the indicator for different versions (refer to chapter 25 Ordering Information).

The used platform is the microcontroller MSP430F2274 in combination with the transceiver CC1101 from the Texas Instruments www.ti.com/. For details please refer to [4], [5] and [6].

5. HISTORY FOR THIS DOCUMENT

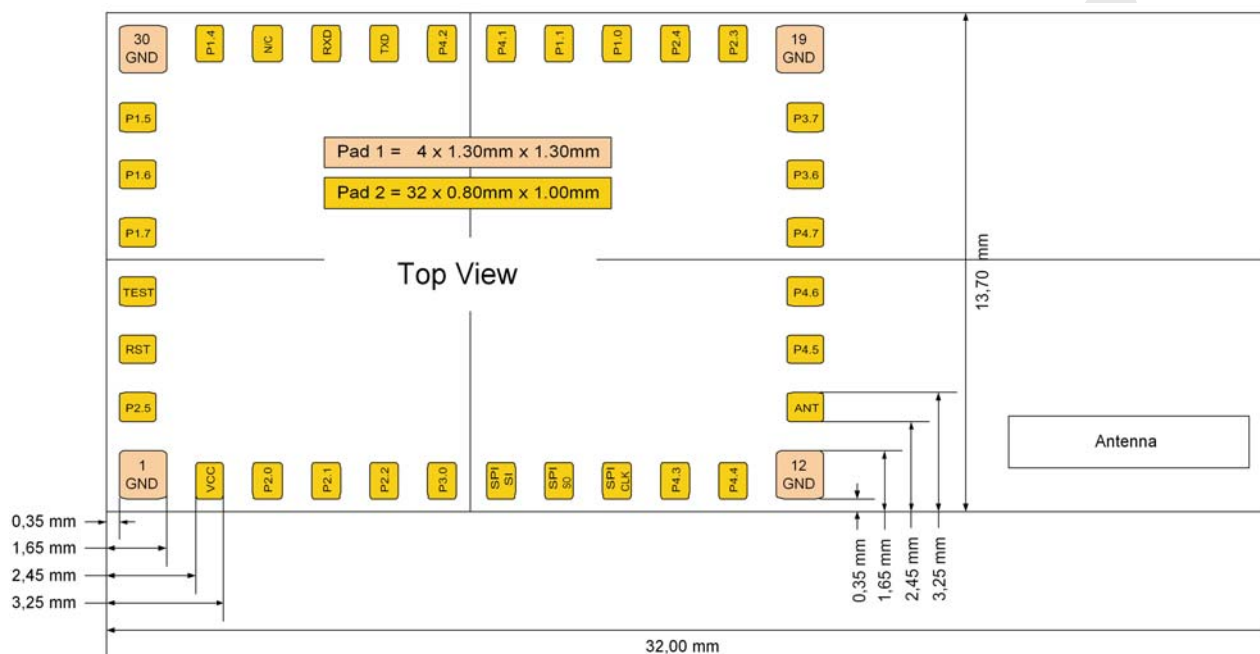
Versionsverwaltung dieses Dokumentes

Revision Version	Date Datum	Modification / Remarks Änderungen / Bemerkungen
A	29.06.2009	Initial draft version
B	30.07.2009	Update chapter Block Diagram, EEPROM now optional. Added values for chapter Absolute Maximum Ratings, Operating Conditions, DC Electrical Characteristics and AC Electrical Characteristics Correct some incorrect links.
C	16.02.2010	Correct the Ordering Information. Updated chapter Development of Applications, Packaging and Related Documents.
D	13.03.2010	Add new ordering codes, which includes the EEPROM version, modification in chapter Ordering Information.

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6. TERMINAL LAYOUT Anschlußbelegung



Please refer also to the MSP430F2274 technical data sheet and reference manual, which is given in [4] and [5] in the chapter Related Documents.

Pin No.	Pin Name	Pin Type	Description
1	GND	PWR	Ground
2	VCC	PWR	Supply Voltage
3	P2.0	I/O	General-purpose digital I/O pin / ACLK output ADC10, analog input A0 / OA0, analog input I0
4	P2.1	I/O	General-purpose digital I/O pin / Timer_A, clock signal at INCLK SMCLK signal output ADC10, analog input A1 / OA0, analog output
5	P2.2	I/O	General-purpose digital I/O pin Timer_A, capture: CCI0B input/BSL receive, compare: OUT0 output ADC10, analog input A2 / OA0, analog input I1
6	P3.0	I/O	General-purpose digital I/O pin USCI_B0 slave transmit enable / USCI_A0 clock input/output ADC10, analog input A5
7	SPI SI	I/O	General-purpose digital I/O pin USCI_B0 slave in/master out in SPI mode
8	SPI SO	I/O	General-purpose digital I/O pin USCI_B0 slave out/master in in SPI mode
9	SPI SCLK	I/O	General-purpose digital I/O pin USCI_B0 clock input/output / USCI_A0 slave transmit enable

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Pin No.	Pin Name	Pin Type	Description
10	P4.3	I/O	General-purpose digital I/O pin Timer_B, capture: CCI0B input, compare: OUT0 output ADC10 analog input A12 / OA0 analog output
11	P4.4	I/O	General-purpose digital I/O pin Timer_B, capture: CCI1B input, compare: OUT1 output ADC10 analog input A13 / OA1 analog output
12	GND	PWR	Ground
13	ANT	RF	Pin for external antenna (50 Ω)
14	P4.5	I/O	General-purpose digital I/O pin Timer_B, compare: OUT2 output ADC10 analog input A14 / OA0 analog input I3
15	P4.6	I/O	General-purpose digital I/O pin Timer_B, switch all TB0 to TB3 outputs to high impedance ADC10 analog input A15 / OA1 analog input I3
16	P4.7	I/O	General-purpose digital I/O pin Timer_B, clock signal TBCLK input
17	P3.6	I/O	General-purpose digital I/O pin ADC10 analog input A6 / OA0 analog input I2
18	P3.7	I/O	General-purpose digital I/O pin ADC10 analog input A7 / OA1 analog input I2
19	GND	PWR	Ground
20	P2.3	I/O	General-purpose digital I/O pin Timer_A, capture CCI1B input, compare: OUT1 output ADC10, analog input A3 / negative reference voltage output/input OA1, analog input I1 / OA1, analog output
21	P2.4	I/O	General-purpose digital I/O pin / Timer_A, compare: OUT2 output ADC10, analog input A4 / positive reference voltage output/input OA1, analog input I0
22	P1.0	I/O	General-purpose digital I/O pin Timer_A, clock signal TACLK input ADC10, conversion clock
23	P1.1	I/O	General-purpose digital I/O pin Timer_A, capture: CCI0A input, compare: OUT0 output/BSL transmit
24	P4.1	I/O	General-purpose digital I/O pin Timer_B, capture: CCI1A input, compare: OUT1 output
25	P4.2	I/O	General-purpose digital I/O pin Timer_B, capture: CCI2A input, compare: OUT2 output
26	TXD	I/O	General-purpose digital I/O pin USCI_A0 transmit data output in UART mode, slave in/master out in SPI mode
27	RXD	I/O	General-purpose digital I/O pin USCI_A0 receive data input in UART mode, slave out/master in in SPI mode
28	N/C	---	Not Connected
29	P1.4	I/O	General-purpose digital I/O pin / SMCLK signal output Test Clock input for device programming and test
30	GND	PWR	Ground
31	P1.5	I/O	General-purpose digital I/O pin / Timer_A, compare: OUT0 output Test Mode Select input for device programming and test
32	P1.6	I/O	General-purpose digital I/O pin / Timer_A, compare: OUT1 output Test Data Input or Test Clock Input for programming and test

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Pin No.	Pin Name	Pin Type	Description
33	P1.7	I/O	General-purpose digital I/O pin / Timer_A, compare: OUT2 output Test Data Output or Test Data Input for programming and test
34	TEST	I/O	Selects test mode for JTAG pins on Port1. The device protection fuse is connected to TEST. Spy-Bi-Wire test clock input during programming and test
35	RST	I/O	Reset or nonmaskable interrupt input Spy-Bi-Wire test data input/output during programming and test
36	P2.5	I/O	General-purpose digital I/O pin Input for external DCO resistor to define DCO frequency

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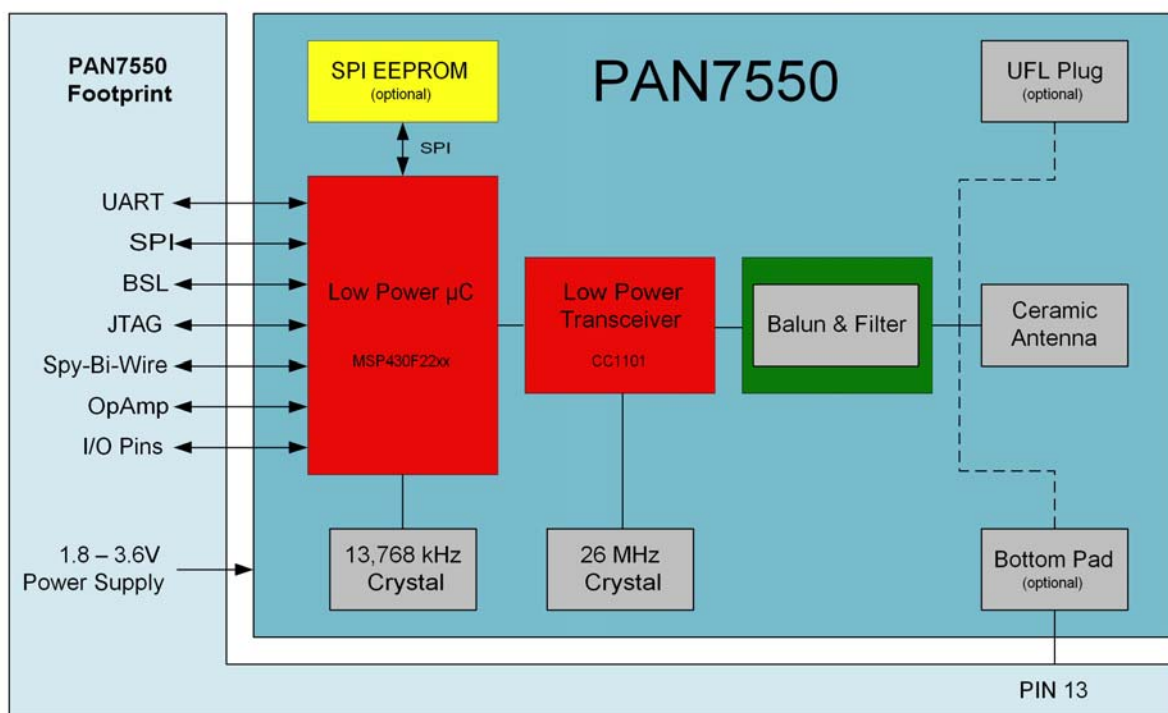
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7. BLOCK DIAGRAM Blockdiagramm



8. KEY PARTS LIST Liste der Schlüsselkomponenten

Part Name Teilenummer	Material Material
PCB	Glass cloth epoxide resin with gold plating
Casing	Material: ZSNC S1S8 8/8, thickness 0.30mm
IC part name	MSP430F2274 (Texas Instruments www.ti.com/) All information are based on [4] chapter 28. CC1101 (Texas Instruments www.ti.com/) All information are based on [6] chapter 28.

9. TEST CONDITIONS Meßbedingungen

Measurements are made under room temperature and humidity unless otherwise specified.
Messungen unter normalen Bedingungen, Abweichungen sind gesondert notiert.

Temperature	25 \pm 10°C	Humidity	40 to 85%RH
Temperatur	25 \pm 10°C	Luftfeuchtigkeit	40 to 85%RH

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10. ABSOLUTE MAXIMUM RATINGS

Absolute Grenzwerte

The maximum ratings may not be exceeded under any circumstances (not even momentarily) as permanent damage to the module will result.

No.	Item Punkt	Symbol Zeichen	Absolute Maximum Ratings Absolute Grenzwerte	Unit Einheit
1	Supply voltage	V_{CC}	-0.3 to +3.9	Vdc
2	Ripple on V_{CC}	V_{CCrip}	tbd ⁽²⁾ (ripple frequency $\geq 200kHz$)	mVpp
3	Digital input voltages	V_{in}	-0.3 to $V_{CC}+0.3$ (max 3.9)	Vdc
4	Instantaneous maximum current Single pin limit for all digital I/O pins ⁽¹⁾	I_{BDB}	± 6	mAdc
5	Storage temperature range	T_{stg}	-50 to +150	°C
6	Operating temperature range	T_{op}	-40 to +85	°C
7	RF Input Power	P_{max}	+10	dBm
8	ESD on any pin except for pin 13 ANT. Human Body Model (HBM)	V_{THHBM}	750	V
9	Lead temperature Löttemperatur	T_{Death}	Please refer to chapter 15.2.	°C
10	Moisture Sensitivity Level	MSL	3 (168 hours)	

Notes:

- (1) The maximum total current for all digital I/O pins combined should not exceed ± 48 mAdc to hold the maximum voltage drop specified in [4].
- (2) The supply voltage must be free of AC ripple voltage (for example from a battery or a low noise regulator output). For noisy supply voltages, please provide a decoupling circuit (for example a ferrite in series connection and a blocking capacitor to ground of at least $47\mu F$ directly at the module). The exact ripple tolerance will be published in a later revision.

11. OPERATING CONDITIONS

Betriebsbedingungen

No.	Item	Condition / Remark	Sym bol	Value			Unit
				Min	Typ	Max	
1	Supply voltage	The typical value is recommended	V_{CC}	1.8	3.0	3.6	Vdc
2	RF Input Frequency	When using onboard ceramic antenna	f_{in}	868.0	868.3	870.0	MHz
3	Return loss of load at pin 13 ANT	Receive/Transmit Mode to 50 Ω reference load	A	-10	-	-	dB
4	Positive-going input threshold voltage	for all digital I/O pins	V_{IT+}	$0.45 \times V_{CC}$		$0.75 \times V_{CC}$	V
5	Negative-going input threshold voltage	for all digital I/O pins	V_{IT-}	$0.25 \times V_{CC}$		$0.55 \times V_{CC}$	V
6	Input voltage hysteresis	for all digital I/O pins	V_{hys-}	0.3		1.0	V

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No.	Item	Condition / Remark	Sym bol	Value			Unit
				Min	Typ	Max	
7	Operating temperature range		T _{op}	-40	+25	+85	°C

12. DC ELECTRICAL CHARACTERISTICS

Assume V_{CC} = 3.0V, T_{amb} = 25°C if nothing else stated

No.	Item	Condition / Remark	Symbol	Value			Unit
				Min	Typ	Max	
1	Transmit current consumption	Transmit Mode @ 10dBm	I _{CCT}	-	32	-	mA
2	Receive current consumption	Receive Mode	I _{CCR}	-	19	-	mA
3	Low power current consumption	Sleep (µC LPM 3)	I _{CCS}	-	0,6	-	µA
		Stand by (Idle, µC activ)	I _{CCI}	-	2	-	mA
4	digital I/O pin characteristics	Please refer to [4] MCU Electrical Characteristics					
5	digital I/O pin input capacitance	all non-supply pins	C _{In}			5	pF
6	Low voltage warning/detection Power on reset re-arm voltage	Please refer to [4] MCU Electrical Characteristics					

13. A/D CONVERTER CHARACTERISTICS

No	Item	Remark
1	A/D characteristics	Please refer to [4] MCU Electrical Characteristics
2	A/D timing/performance characteristics	Please refer to [4] MCU Electrical Characteristics

The A/D negative reference voltage VREF- is connected to pin 20 (P2.3)

The A/D positive reference voltage VREF+ is connected to pin 21 (P2.4)

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14. AC ELECTRICAL CHARACTERISTICS

$V_{CC} = 3.0V$, $T_{amb} = 25^{\circ}C$, 50Ω load at ANT

No Nr	Receiver Empfänger	Limit Min	Typ	Max	Unit Einheit
1	Sensitivity @ 1.2kbps, 1% PER	-	-109	-	dBm
2	Saturation (maximum input power level)	-	-15	-	dBm
3	In-band Spurious Emission	-	-	-65	dBm
4	Spurious Emissions <1GHz	-	-66	-60	dBm
5	Spurious Emissions >1GHz	-	-66	-33	dBm

No Nr	Transmitter Sender	Limit Min	Typ	Max	Unit Einheit
1	Maximum Output Power (measured at pin 13 and UFL)	-	9	10	dBm
2	Minimum Output Power	-	-30	-	dBm
3	Power Control Range	-	40	-	dB
4	Over the Air Data Rate	-	-	500	kbps
5	2 nd harmonic @ +10dBm	-	-35	-33	dBm
6	3 rd harmonic @ +10dBm	-	-42	-33	dBm
7	Spurious Emissions <1GHz, except No 8 @ +10dBm	-	-60	-39	dBm
8	Spurious Emissions 470 MHz to 862 MHz @ +10dBm	-	-66	-57	dBm
9	Spurious Emissions >1GHz @ +10dBm	-	-	-33	dBm

No Nr	Stand By (Idle) and Sleep Mode In Bereitschaft und Stromsparmodus	Limit Min	Typ	Max	Unit Einheit
1	Spurious Emissions <1GHz	-	-65	-57	dBm
2	Spurious Emissions >1GHz	-	-65	-33	dBm

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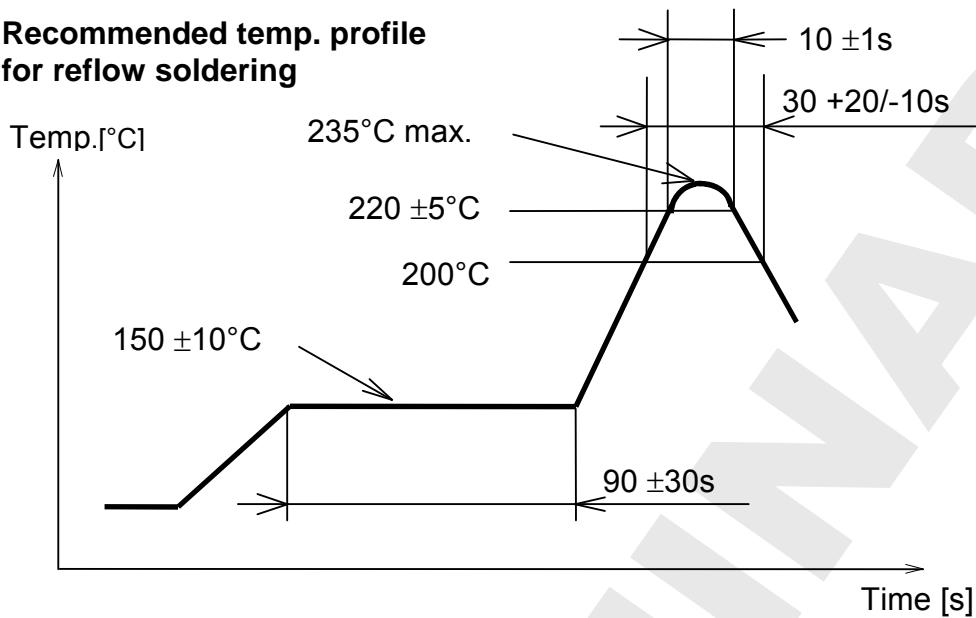
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15. SOLDERING TEMPERATURE - TIME PROFILE (FOR REFLOW SOLDERING)

Temperatur-Zeit Profil für die Reflowlötung

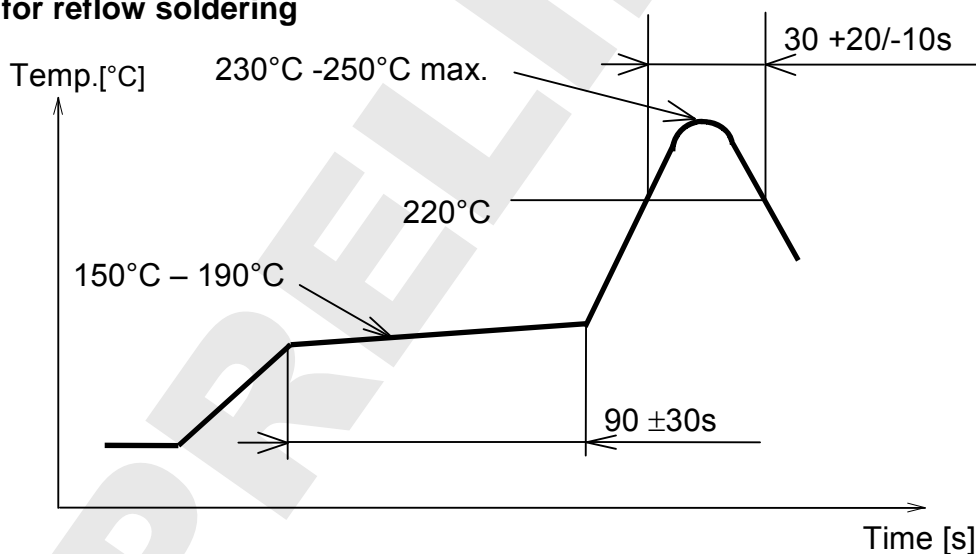
15.1. FOR LEAD SOLDER

**Recommended temp. profile
for reflow soldering**



15.2. FOR LEAD FREE SOLDER

**Our used temp. profile
for reflow soldering**



Reflow permissible cycles: 2

Opposite side reflow is prohibited due to the module weight.

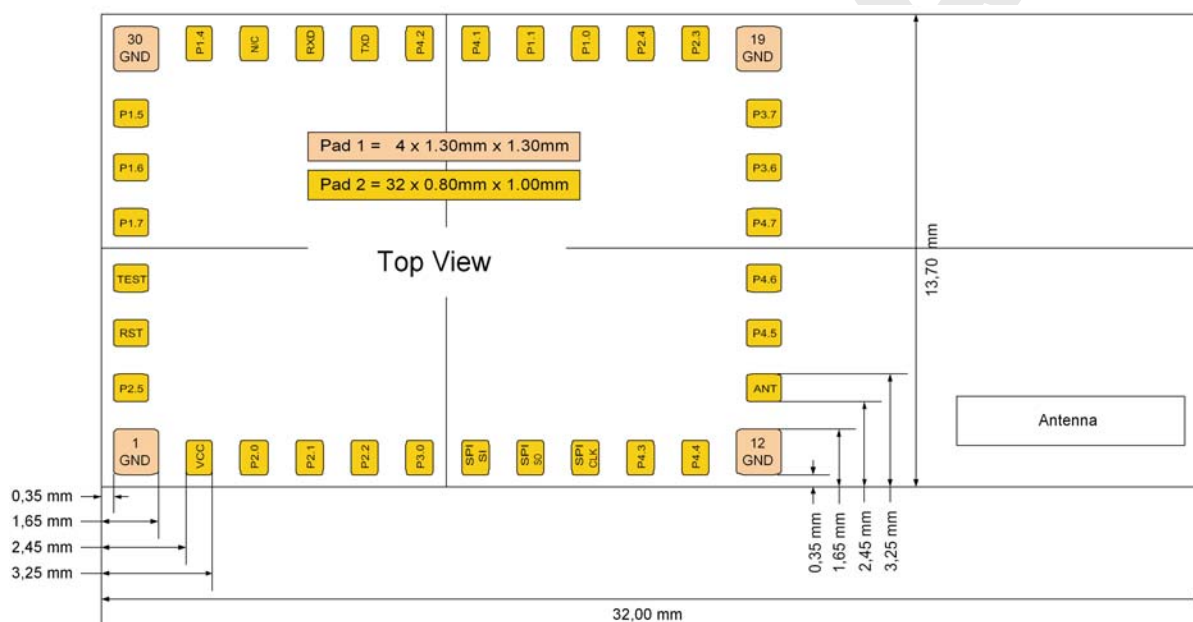
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16. MODULE DIMENSIONS Modulabmessungen

No.	Item Punkt	Dimension Abmessung	Tolerance Toleranz	Remark Bemerkung
1	Width	13.70	± 0.20	
2	Lenght	32.00	± 0.20	
3	Height	2.45	± 0.10	With case

17. FOOTPRINT OF THE MODULE Lötpads vom Modul



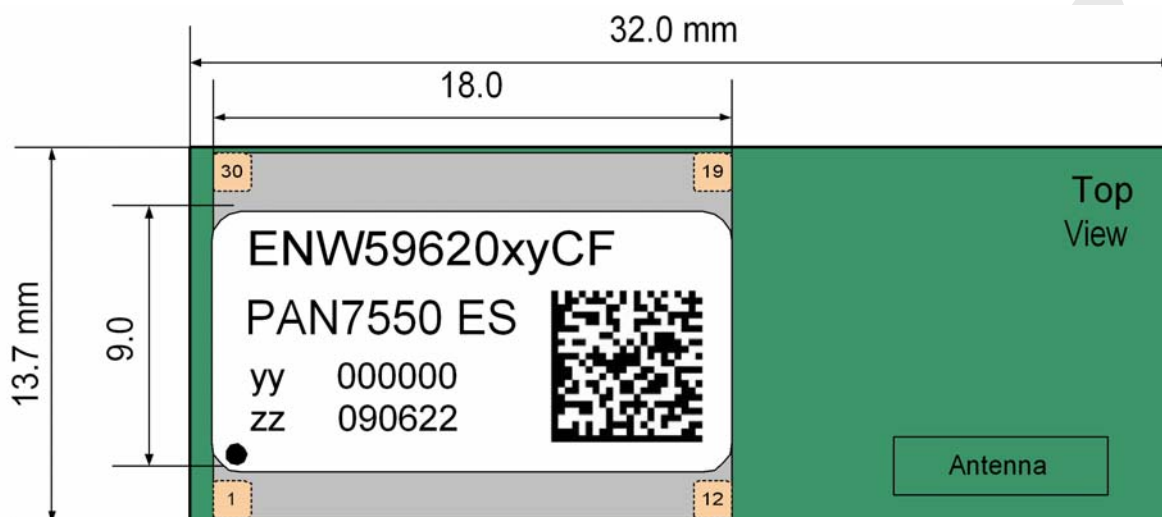
All dimensions are in millimeters.
The outer dimensions have a tolerance of $\pm 0.2\text{mm}$.

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18. LABELING DRAWING

Kennzeichnung des Moduls durch Label



This label is suitable for reflow soldering and designed for the engineering sample status.

Information in the 2D-Barcode are the date code in the format Year-Month-Day [6 signs, here 081211], serial number [7 signs, here 0000000], ordering number [8 signs; without ENW and F, please refer also to chapter 25], the identifier for the hardware release [2 signs, here yy], the identifier for the software release [2 signs, here zz] and the ES, separated by a semicolon.

ES stands for Engineering Samples, please refer to chapter General Information.

In mass production status, the ES will be eliminated.

The point on the label (below left) is the identifier for pin 1 of the module.

As a summary:

xy	Number 9 and 10 from the ordering code, please refer to chapter 25
yy	Identifier for the hardware version
zz	Identifier for the software version

19. MECHANICAL REQUIREMENTS

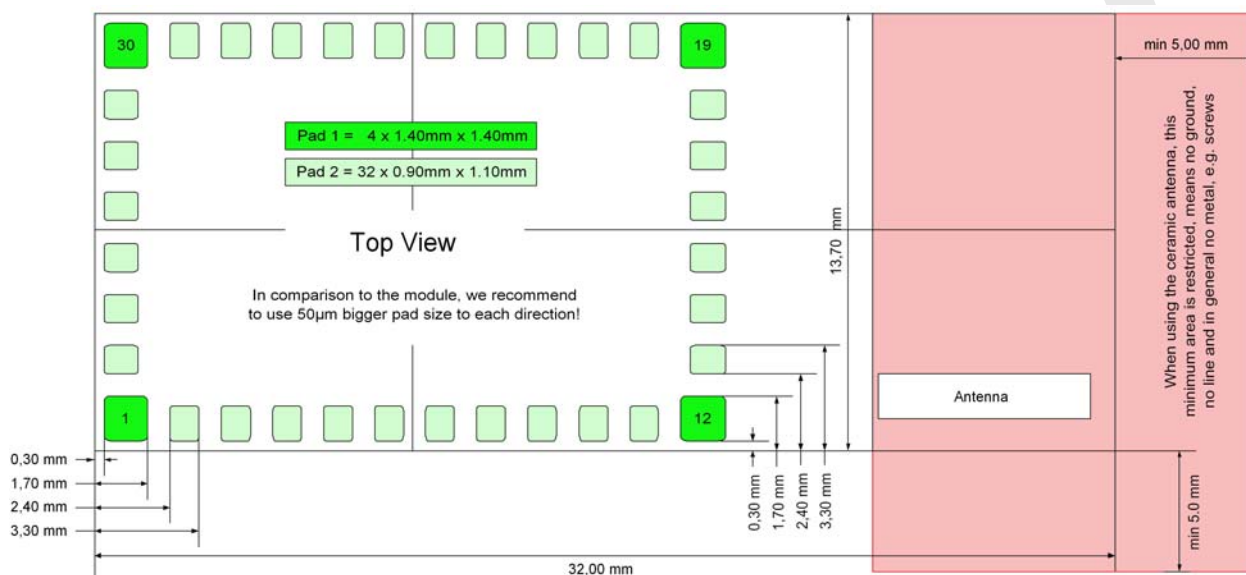
Mechanische Anforderungen

No.	Item Punkt	Limit Grenzwerte	Condition Bedingung
1	Solderability Lötfähigkeit	More than 75% of the soldering area shall be coated by solder Mehr als 75% der Lötfläche soll mit Lötpaste bedeckt sein.	Reflow soldering with recommendable temperature profile
2	Resistance to soldering heat	Must satisfy electrical requirements and not have mechanical damage	Please refer to chapter 15.2.

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20. RECOMMENDED LAND PATTERN Empfohlenes Land Pattern



Dimensions in millimeters.

The land pattern dimensions above are meant to serve only as a guid. This information is provided without any legal liability.

For the footprint, it is recommended to incorporate a 50µm bigger size for the pads in each direction compared to the module footprint. Please refer to chapter 17. Footprint of the Module.

For the solder paste screen, please use the same screen for the module. Solder paste screen cutouts (with slightly different dimensions) might be optimum depending on your soldering process. For example, the chosen solder paste screen thickness might have an effect. The solder screen thickness depends on your production standard. We recommend 120µm to 150µm.

IMPORTANT:

Although the bottom side of PAN7550 is fully coated, no copper such as through hole vias, planes or tracks on the board component layer should be located below the PAN7550 to avoid creating a short. In cases where a track or through hole via has to be located under the module, please make a note that it has to be kept away from PAN7550 bottom pads. The PAN7550 multilayer pcb contains an inner RF shielding plane, therefore no pcb shielding plane below the module is needed.

When using the antenna pad version, please place the antenna on the edge of your carrier board (if allowable).

If you have any questions on these points, please contact your local Panasonic representative.

Before releasing the layout, we recommend to send the schematic and layout for final check to wireless@eu.panasonic.com.

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21. DEVELOPMENT OF APPLICATIONS

Please refer to [1], [2] and [3] in chapter 28. Related Documents.

22. RELIABILITY TESTS

Zuverlässigkeitstests

The measurement should be done after being exposed to room temperature and humidity for 1 hour.

Die Messungen sollten erst nach einer Stunde Lagerung unter normalen Bedingungen erfolgen.

No.	Item Punkt	Limit Grenzwerte	Condition Bedingung
1	Vibration test	Electrical parameter should be in specification	a) Freq.:10~50Hz, Amplitude:1.5mm a) 20min. / cycle, 1hrs. each of XYZ axis b) Freq.:30~100Hz, 6G b) 20min. / cycle, 1hrs. each of XYZ axis
2	Shock test	the same as above	Dropped onto hard wood from height of 50cm for 3 times
3	Heat cycle test	the same as above	-40°C for 30min. and +85°C for 30min.; each temperature 300 cycles
4	Moisture test	the same as above	+60°C, 90% RH, 300h
5	Low temp. test	the same as above	-40°C, 300h
6	High temp. test	the same as above	+85°C, 300h

23. CAUTIONS

Warnungen

Failure to do so may result in degrading of the product's functions and damage to the product.

23.1. DESIGN NOTES

Designhinweise

- (1) Please follow the conditions written in this specification, especially the control signals of this module.
- (2) The supply voltage has to be free of AC ripple voltage (for example from a battery or a low noise regulator output). For noisy supply voltages, provide a decoupling circuit (for example a ferrite in series connection and a blocking capacitor to ground of at least 47uF directly at the module).
- (3) This product should not be mechanically stressed when installed.
- (4) Heat is the major cause of shortening the life of these products. Please keep this product away from heat.
Avoid assembly and use of the target equipment in conditions where the products' temperature may exceed the maximum tolerance.
- (5) The supply voltage should not be exceedingly high or reversed. It should not carry noise and/or spikes.
- (6) Please keep this product away from other high frequency circuits.

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23.2. INSTALLATION NOTES

Verarbeitungshinweise

- (1) Reflow soldering is possible twice based on the conditions in chapter 15.
Please set up the temperature at the soldering portion of this product according to this reflow profile.
- (2) Carefully position the products so that their heat will not burn into printed circuit boards or affect the other components that are susceptible to heat.
- (3) Carefully locate these products so that their temperatures will not increase due to the effects of heat generated by neighboring components.
- (4) If a vinyl-covered wire comes into contact with the products, then the cover will melt and generate toxic gas, damaging the insulation. Never allow contact between the cover and these products to occur.
- (5) This product should not be mechanically stressed or vibrated when reflowed.
- (6) If you want to repair your board by hand soldering, please keep the conditions of this chapter.
- (7) Please do not wash this product.
- (8) Please refer to the recommended pattern when designing a board.
- (9) Pressing on parts of the metal cover or fastening objects to the metal will cause damage to the unit.

23.3. USAGE CONDITIONS NOTES

Benutzerhinweise

- (1) Please take measures to protect the unit against static electricity.
If pulses or other transient loads (a large load applied in a short time) are applied to the products, check and evaluate their operation before assembly on the final products.
- (2) Please do not use dropped products.
- (3) Please do not touch, damage or place dirt on the pins.
- (4) Please follow the recommended condition ratings about the power supply applied to this product.
- (5) Electrode peeling strength: Do not add pressure of more than 4.9N when soldered on PCB.
- (6) Pressing on parts of the metal cover or fastening objects to the metal cover will cause damage.
- (7) These products are intended for general purpose and standard use in general electronic equipment, such as home appliances, office equipment, information and communication equipment.

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23.4. STORAGE NOTES

Lagerhinweise

(1) The module may not be stressed mechanically during storage.

(2) Do not store these products in the following conditions or the performance characteristics of the product, such as RF performance will be adversely affected:

Storage in salty air or in an environment with a high concentration of corrosive gas, such as Cl2, H2S, NH3, SO2, or NOX

Storage in direct sunlight

Storage in an environment where the temperature may be outside the range of 5°C to 35°C range, or where the humidity may be outside the 45 to 85% range.

Storage of the products for more than one year after the date of delivery at your company if the avoidance all the above conditions (1) to (3) have been met.

(3) Storage period: Please check the adhesive strength of the embossed tape and soldering after 6 months of storage.

(4) Please keep this product away from water, poisonous gas and corrosive gas.

(5) This product should not be stressed or shocked when transported.

(6) Please follow the specification when stacking packed crates (max. 10).

23.5. SAFETY CAUTIONS

Sicherheitshinweise

These specifications are intended to preserve the quality assurance of products and individual components.

Before use, check and evaluate the operation when mounted on your products. Abide by these specifications, without deviation when using the products. These products may short-circuit. If electrical shocks, smoke, fire, and/or accidents involving human life are anticipated when a short circuit occurs, then provide the following failsafe functions, as a minimum.

(1) Ensure the safety of the whole system by installing a protection circuit and a protection device.

(2) Ensure the safety of the whole system by installing a redundant circuit or another system to prevent a single fault causing an unsafe status.

23.6. OTHER CAUTIONS

Weitere Hinweise

(1) This specification sheet is copyrighted. Please do not disclose it to a third party.

(2) Please do not use the products for other purposes than those listed.

(3) Be sure to provide an appropriate fail-safe function on your product to prevent an additional damage that may be caused by the abnormal function or the failure of the product.

(4) This product has not been manufactured with any ozone chemical controlled under the Montreal Protocol.

(5) These products are not intended for other uses, other than under the special conditions shown below. Before using these products under such special conditions, check their performance and reliability under the said special

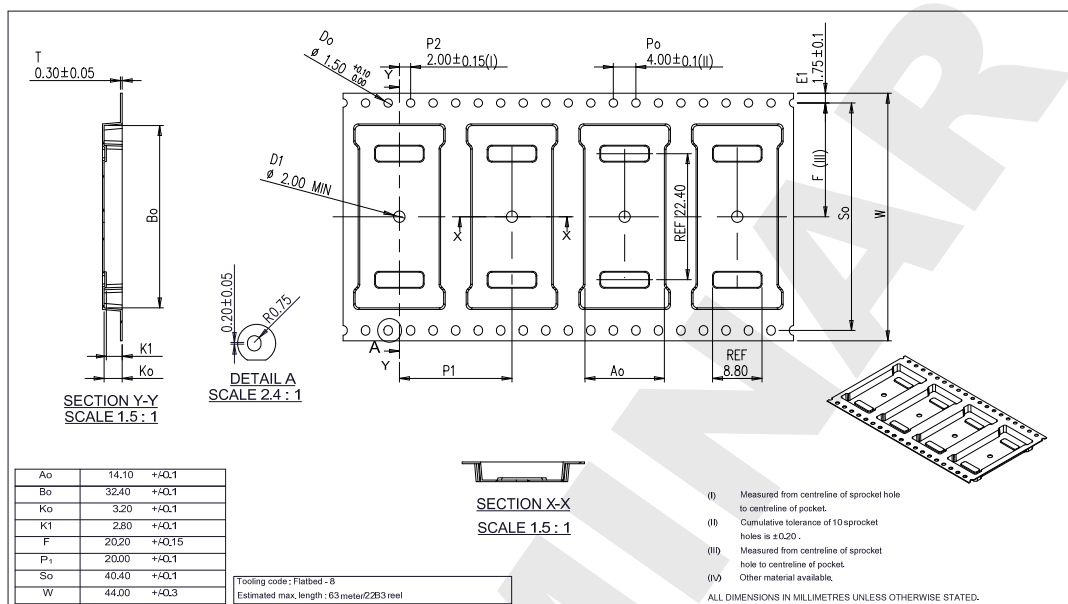
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<p>conditions carefully to determine whether or not they can be used in such a manner.</p> <ul style="list-style-type: none">• In liquid, such as water, salt water, oil, alkali, or organic solvent, or in places where liquid may splash.• In direct sunlight, outdoors, or in a dusty environment• In an environment where condensation occurs.• In an environment with a high concentration of harmful gas (e.g. salty air, HCl, Cl₂, SO₂, H₂S, NH₃, and NO_x) <p>(6) If an abnormal voltage is applied due to a problem occurring in other components or circuits, replace these products with new products because they may not be able to provide normal performance even if their electronic characteristics and appearances appear satisfactory.</p> <p>(7) When you have any question or uncertainty, both of you and Panasonic sincerely cope with it.</p>					
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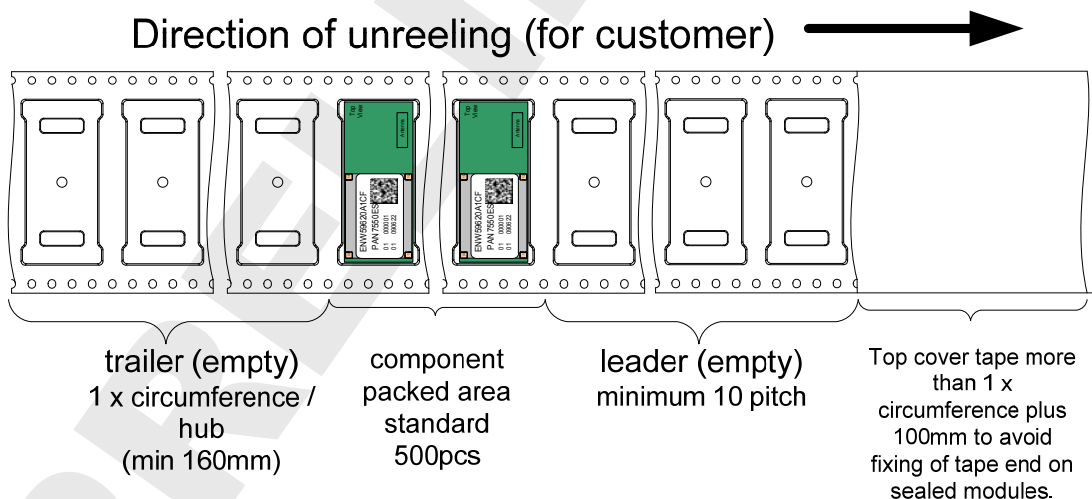
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24. PACKAGING Verpackung

24.1. TAPE DIMENSION



24.2. PACKING IN TAPE



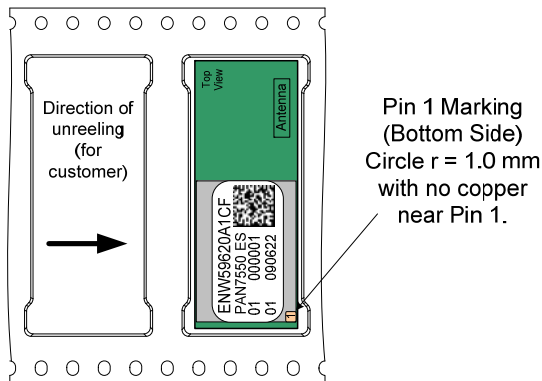
Empty spaces in component packed area shall be less than two per reel and those spaces shall not be consecutive.

Top cover tape shall not be found on reel holes and shall not stick out from the reel.

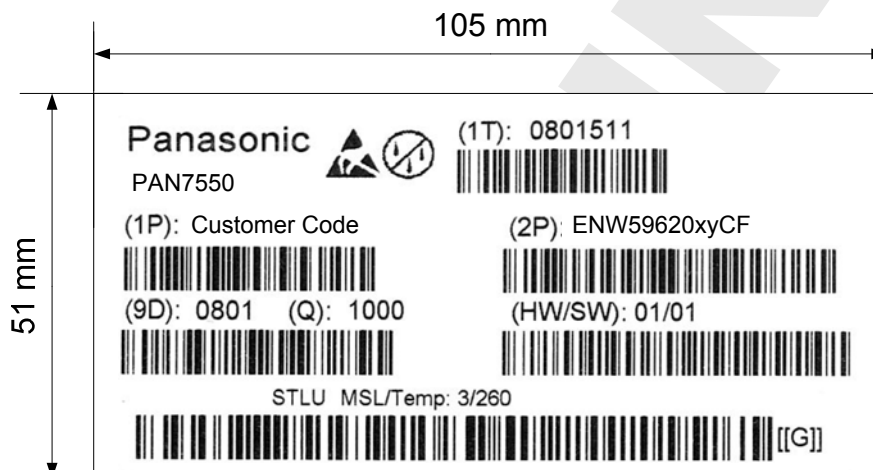
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24.3. COMPONENT DIRECTION Komponentenanordnung



24.4. LABEL FOR PACKAGE

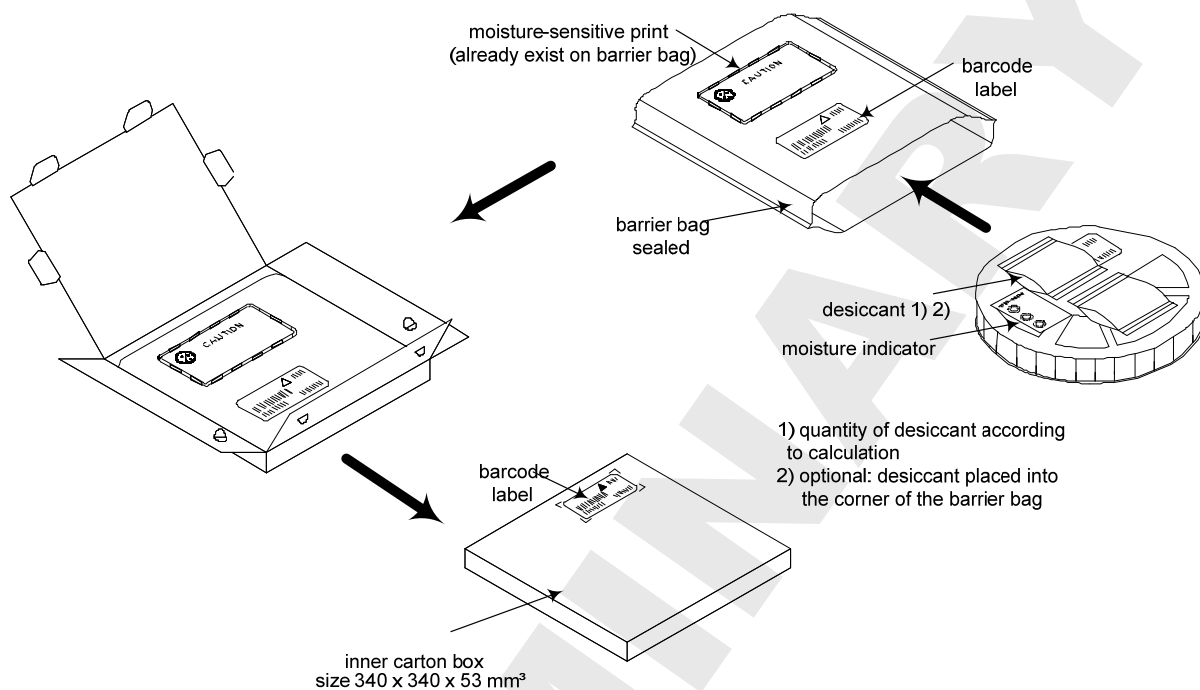


- (1T): Lotcode [YYWWDLL]
YY year here 08
WW normal calendar week here 01
D day here 5 (Friday)
L line identifier, if more as one here 1
L lot identifier per day e.g. 1, 2, 3...
- (1P) Customer Code, if any, otherwise put company name on it.
- (2P) Panasonic Order Code, refer to chapter 25.
- (9D) Datecode as [YYWW]
- (Q) Quantity, here 1000, can differ on customer request.
- (HW/SW) Hardware /Software Release, refer to chapter 25.
- [[G]] Identifier that the product is RoHS conform, please refer also to 26.

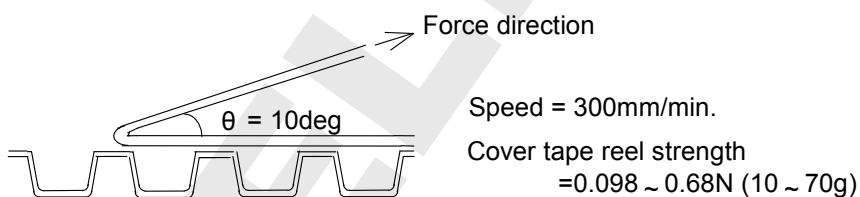
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24.6. TOTAL PACKING HANDLING



24.7. COVER TAPE REEL STRENGTH



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25. ORDERING INFORMATION

Bestellinformationen

No.	Ordering part number	Description	MOQ ⁽¹⁾
1	ENW5Z620A2CF ⁽²⁾	Engineering Sample PAN7550 (no EEPROM) Wireless M-Bus Module, which includes <i>Ceramic Antenna</i> Wireless M-Bus Stack from ScatterWeb included, please refer to [1] .	1
2	ENW5Z620B2CF ⁽²⁾	Engineering Sample PAN7550 (no EEPROM) Wireless M-Bus Module, which includes <i>UFL Connector</i> Wireless M-Bus Stack from ScatterWeb included, please refer to [1] .	1
3	ENW5Z620C2CF ⁽²⁾	Engineering Sample PAN7550 (no EEPROM) Wireless M-Bus Module, which includes <i>RF out on SMD pad</i> Wireless M-Bus Stack from ScatterWeb included, please refer to [1] .	1
4	ENW5Z620A1CF ⁽²⁾	Same as number 1, but without Software	1
5	ENW5Z620B1CF ⁽²⁾	Same as number 2, but without Software	1
6	ENW5Z620C1CF ⁽²⁾	Same as number 3, but without Software	1
7	ENW5Z622A2CF ⁽²⁾	Engineering Sample PAN7550 (with EEPROM) Wireless M-Bus Module, which includes <i>Ceramic Antenna</i> Wireless M-Bus Stack from ScatterWeb included, please refer to [1] .	1
8	ENW5Z622B2CF ⁽²⁾	Engineering Sample PAN7550 (with EEPROM) Wireless M-Bus Module, which includes <i>UFL Connector</i> Wireless M-Bus Stack from ScatterWeb included, please refer to [1] .	1
9	ENW5Z622C2CF ⁽²⁾	Engineering Sample PAN7550 (with EEPROM) Wireless M-Bus Module, which includes <i>RF out on SMD pad</i> Wireless M-Bus Stack from ScatterWeb included, please refer to [1] .	1
10	ENW5Z622A1CF ⁽²⁾	Same as number 7, but without Software	1
11	ENW5Z622B1CF ⁽²⁾	Same as number 8, but without Software	1
12	ENW5Z622C1CF ⁽²⁾	Same as number 9, but without Software	1

Note:

- (1) Minimum order quantity.
- (2) The "Z" in the ordering part number, refers to the engineering sample status. After mass production the "Z" will be changed to the "9".

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<p>26. ROHS DECLARATION RoHS-Erklärung</p> <p>Declaration of environmental compatibility for supplied products:</p> <p>Hereby we declare to our best present knowledge based on declaration of our suppliers that this product does not contain the following substances which are banned by Directive 2002/95/EC (RoHS) or contains a maximum concentration of 0.1% by weight in homogeneous materials for</p> <ul style="list-style-type: none"> • Lead and lead compounds • Mercury and mercury compounds • Chromium (VI) • PBB (polybrominated biphenyl) category • PBDE (polybrominated biphenyl ether) category <p>And a maximum concentration of 0.01% by weight in homogeneous materials for</p> <ul style="list-style-type: none"> • Cadmium and cadmium compounds 			
<p>27. DATA SHEET STATUS Datenblatt Status</p> <p>This data sheet contains data from the PRELIMINARY specification. Supplementary data will be published at a later date. Panasonic Electronic Devices Europe GmbH reserves the right to change the specification without notice, in order to improve the design and supply the best possible product.</p> <p>Please consult the most recently issued data sheet before initiating or completing a design. If there is an update, please download under: PAN7550 Latest Data Sheet!</p>			
<p>28. RELATED DOCUMENTS Mitgeltende Dokumente</p> <p>For an update, please search in the suitable homepage.</p> <ul style="list-style-type: none"> [1] User's Guide to the Wireless M-Bus Stack, ScatterWeb GmbH [Download] [2] User's Guide to the Wireless M-Bus Stack, company Steinbeis [Download] [3] Manual to the Application Kit from Panasonic [Download] [4] Datasheet MSP430F2274, Document Number: SLAS504B -- JULY 2006 -- REVISED JULY 2007, Texas Instruments [5] MSP430Fx2xx User Manual, Document Number: SLAU144E, Texas Instruments [6] CC1101 Datasheet, Document Number: SWRS061E -- April 2009 -- REVISED April 2009, Texas Instruments 			
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29. GENERAL INFORMATION
Allgemeine Informationen

© Panasonic Electronic Devices Europe GmbH 2010.
All rights reserved.
This product description does not claim to be complete and free of mistakes.
Please contact the related product manager with any errata inquiries.

If we deliver samples to the customer, these samples have the status Engineering Samples. This means, the design of this product is not yet completed. Engineering Samples may be partially or fully functional, and there may be differences published in the Data Sheet. Engineering Samples are not qualified and are not to be used for reliability testing or series production.

Disclaimer:
Customer acknowledges that samples may deviate from the Data Sheet and may bear defects due to their status of development and the lack of qualification mentioned above. Panasonic Electronic Devices Europe GmbH disclaims any liability or product warranty for Engineering Samples. In particular, Panasonic Electronic Devices Europe GmbH disclaims liability for damages caused by

- the use of the Engineering Sample other than for Evaluation Purposes, particularly the installation or integration in an other product to be sold by Customer,
- deviation or lapse in function of Engineering Sample,
- improper use of Engineering Samples.

Panasonic Electronic Devices Europe GmbH disclaims any liability for consequential and incidental damages. In case of any questions, please contact your local sales partner or the related product manager.

30. LIFE SUPPORT POLICY
Politik für Lebenserhaltungssysteme

This Panasonic Electronic Devices Europe GmbH product is not designed for use in life support appliances, devices, or systems where malfunction can reasonably be expected to result in a significant personal injury to the user, or as a critical component in any life support device or system whose failure to perform can be reasonably expected to cause the failure of the life support device or system, or to affect its safety or effectiveness. Customers using or selling these products for use in such applications do so at their own risk and agree to fully indemnify Panasonic Electronic Devices Europe GmbH for any damages resulting.

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